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FOURTH SCIENTIFIC CONFERENCE ON PROBLEMS OF GROWTH MORPHOLOGY, PHYSIOLOGY, AND BIOCHEMISTRY

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by Ye. S. Yakovleva,
I. F. Konkin, and B. S. Svadlovskiy

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The organization of conferences on growth morphology, physiology, and biochemistry became the tradition of the Scientific Research Institute of Physical Education and School Hygiene of the APN (Academy of Pedagogical Sciences) RSFSR (Moscow).

From 2 to 5 March 1959 there took place the Fourth Scientific Conference. Scientific workers from 36 cities of the Soviet Union participated. The honored guests of the Conference were scientists from the people's democracies -- B. A. Yanev (Bulgaria), G. V. Militserova (Poland) and I. Meysner (Czechoslovakia).

About 200 applications were submitted in regard to reports, and the theses of the reports were published*; however, only 111 reports were included in the program of the Conference. The work of the Conference was conducted in plenary sessions and in two sections: the growth physiology and biochemistry and the growth morphology.

In opening the Conference, the Director of the Scientific Research Institute of Physical Education and School Hygiene, A. A. Markosyan noted that the historic decisions of the Extraordinary 21st Congress of the CPSU place before the scientists a number of new problems in the field of school hygiene and physical education. The problems of strengthening the health of children in every possible way, as well as their mental and physical development are indissolubly connected with the Communist transformation of society which must train the new man by harmoniously combining within him intellectual richness, moral

*Data of the Fourth Scientific Conference on Problems of Growth Morphology, Physiology, and Biochemistry. Publishing House of the APN RSFSR, Moscow, 1959.

purity, and physical perfection. A. A. Markosyan expressed confidence that the joint, collective work of morphologists, physiologists and biochemists will lead, within the next few years, to the creation of a modern teaching on the anatomico-physiological development of the child.

B. A. Yanev (Bulgaria) and I. Meysner (Czechoslovakia) told the Conference of the scientific work which is being carried out in their countries on the theory and practice of physical education, particularly in anthropological characteristics of the child population. G. V. Militserova (Poland) submitted data on the connection and changes of body types with the physical training of students of technical schools of physical culture and ballet schools.

V. V. Bunak (Moscow) submitted a report "On Certain Current Problems of the Study of Physical Develppment During the Period of Growth." He indicated that modern anthropometric data used in sanitary statistical works only permit the elucidation of drastic changes in the physical state of the child population, whereas the researcher can obtain considerably more complete information if he takes into account certain correlations of body measurements, nonuniform but equally favorable for the manifestation of physical strength. On this basis the author considers it experient to single out "growth types." In the positive evaluation of the author's theses a suggestion was made at the conference that the determination of the "growth type" be supplemented by standard physiological tests accessible to study.

V. I. Puzik (Moscow) in the report "On the Evaluation of Histochemical Reactions in the Process of Growth Development of Organs" demonstrated, by taking as examples lymphatic nodes and pulmonary tissue, the transition from the widespread metabolic reactions of nucleic acids and polysaccharides during the early ontogenesis to localized reactions in the adult organism.

A large number of reports in the section on growth morphology were devoted to changes in the osseo-muscular system.

The Morphological Laboratory of the Scientific Research Institute of Physical Education and School Hygiene of the APN RSFSR (Moscow) submitted data of X-ray studies of various sections of the skeletal and motor apparatus during its postnatal development. L. N. Semenova noted the heterochronicity of the ossification processes, the synostosis and differentiation of the compact and spongy substances of bones of the lower extremity in children from three to 16 years of age. She emphasized the considerable range

of individual variations in each age-related sex group. C. I. Babak, who investigated the same age-groups, submitted data on the location and sizes of the ossification nuclei in bones of the upper extremity, and N. M. Gurova spoke on the development of the thoracic cavity and the spinal column. A. I. Borisevich (Saratov) related the result of X-ray study of growth of the spongy substance in various sections of the pelvic bones. The periods of the appearance of first pelvic ossification areas in the fetus were noted. P. M. Nazhuga (Kiev) in a report "On the Growth of Tubular Bones During the Post-Natal Ontogenesis" noted the nonuniform intensity of their lengthening in the region of the distal and proximal epiphyses. A. N. Serebryakov (L'vov) reported on the growth changes of the anterior support points of the foot. V. G. Ukrainskiy (Vinnitsa) submitted a report "on Growth Changes in the Synovial Sheaths of Human Hands." The developmental peculiarities of the ligamental apparatus and the blood supply of the synovial sheaths were brought out, as well as the peculiarities of the blood supply of tendons within the sheaths; the effect of the muscular function on the shape of the synovial sheaths was noted. P. F. Shaporenko (Vinnitsa) in his report "To the Age-Related Anatomy of the Shoulder Joint" demonstrated that the process of formation of shoulder joint elements (the degree of development of the ligamental apparatus and the capsule of the joint) is connected with the peculiarities of the muscular activity of the shoulder region. The weak areas of the capsule and the role of the anterior muscles in its fastening were studied; a set of exercises for the strengthening of the joint was recommended.

A. A. Martirosyan (Vinnitsa) noted that the tendons of the flexor muscles of the fingers in adults and in fetuses are fastened not to the base of the median and terminal phalanges, as is thought by some authors, but directly to the phalangeal body. The peculiarities of the crossing of the tendinous fibers of the short crossing on the foot and hand were stated.

Ye. S. Yakovleva (Leningrad) submitted data on the dynamics of age-related changes of weight, physiological diameter, and length of bundles of various muscles of the forearm. The author noted that diverse combinations of the functional properties of muscles are variously reflected on their structure and on the dynamics of their formation. In the analysis of growth changes of muscles it is necessary to take into account also the correlations of muscles-antagonists.

V. A. Latyshev (Krasnodar) touched upon the debatable

question regarding the new formation of muscle fibers during the postnatal period of development. In his opinion, the age-related accretion of the mass of skeletal muscles of a human femur occurs not only as a result of the development of the intermuscular connective tissue and the increase in the size of muscle fibers, but also as the result of newly formed fibers. With age there also takes place a new formation of muscle spindles and an increase in the number of nerve fibers in the muscular branches of the peripheral nerves. The increase of number of proprioreceptors predominates over the increase of the number of muscle fibers.

M. G. Shubich (Krasnodar) in the report "Histochemical Characteristics of the Striated Muscular Tissue" described the distribution of proteins and glycogen in the sarcolemma, sarcoplasma, nuclei, and myofibrils. I. A. Chanturin (Tbilisi) demonstrated the macro- and micromorphological peculiarities of the muscular arteries of the arm and forearm in newborn infants. M. T. Rayskaya (Stalingrad) submitted data on the development of the tongue as a whole (muscles, mucous membrane, glands) and its innervation in human fetuses and in newborn infants.

A prominent place in the work of the Conference was occupied by reports devoted to the problems of age-related morphology of the nervous system.

V. M. Minayeva (Moscow) in the report "The Correlation of Development of the Thalamus Opticus (lateral nucleus), its Reticular Zone, and the Cortical End of the Skin Analyzer" described the relationship between development of the cortex and subcortical formations which she had elucidated. The delayed differentiation of cells of the lateral nucleus during the postnatal period and the nonuniformity of cortical differentiation during the pre- and post-natal period was noted.

M. S. Voyno (Moscow) submitted data on the peculiarities of the cyto- and myelo-architectonic areas of the motor region of the cerebral cortex in man during his postnatal development. It has been established that certain characteristics of the cellular architectonics are formed at various periods. The type of cellular distribution is stabilized early; later the cortical growth is completed as well as the formative period and the development of neurons. I. F. Konkin (Leningrad) in the report "On the Morphology of the Synapses of the Spinal Cord of Human Fetuses and Children" showed that the interneuron connections, in the form of axosomatic and axodendritic synapses in the spinal cord of humans, are already present in the sixth month of the intra-uterine development. There appear simultaneously axovasal (according to B. A. Dolgo-Saburov) synapses analogous in form to the axosomatic and

axodendritic synapses.

A number of reports were devoted to the morphology of the peripheral nervous system.

N. I. Odnoralov (Voronezh) cited data obtained by the collective of the chair under his guidance on the age-related characteristics of the structure of the peripheral nerve stems; the intrastem architectonics of the nerves of children is distinguished by the lace-work of the fine, loop-shaped plexus which in newborn infants descend into the collateral branches more distally than in adults; in newborn infants the nerve membranes are well-delineated, especially the perineural ones.

S. A. Troitskaya (Moscow) demonstrated that the skin, muscular tissue, and the internal organs of a rabbit are threaded with nerve fibers already on the 12th day of intra-uterine life. Within the boundaries of the same analyzer the development of each link conditions the development of the next philogenetically younger link. During the period of intra-uterine life the shape-forming role is effected by the nervous system, organized on the type of segmented reflectory arcs which are the first to be laid out and mature during ontogenesis.

In the report by Ye. P. Mel'man and N. V. Dolishniy (Stanislav) "On the Growth Morphology of the Intramural Neural Apparatus of the Gastro-intestinal Tract of Man" the characteristics of nervous plexuses of various sections of the gastro-intestinal tract in fetuses, children, and adults were cited. The authors arrived at the conclusion of the existence of a higher degree of neurotization of the wall of the gastro-intestinal tract in the early stages of ontogenesis.

G. B. Agarkov (Kiev) cited data on the innervation of the cortical and cerebral substance of the supra-adrenals in fetuses, children and adults. He showed that the supra-renal neural apparatus changes in accordance with age-related changes of the function and histostructure of the organ. Yu. N. Sushkov (Kursk) reported data on the structure of intramural neural nodes and neural cells of the human heart in ontogenesis. Ye. V. Savitskaya (Leningrad) submitted a report on the "Surgical Anatomy of Neural Plexuses of the Left Coronary Cardiac Artery in Individuals of Various Ages."

Ye. M. Luchanskiy (Vinnitsa) described the development of Pachini corpuscles and their gradual differentiation during the postnatal period. The age-related changes of the vascular system of Pachini corpuscles were studied.

Several reports at the morphological section contained

data on the study of glands.

In the report of R. D. Sinel'nikov (Khar'kov) were cited data which attested to the formation of mucous membrane glands as early as in the third to sixth month of the intra-uterine development. The formation of the glands is completed after birth, but their enlargement in size continues up to 14 years. Various environmental conditions, the character of the food, and other factors of the external medium affect the morphology of the glands.

N. V. Popova-Latkina (Astrakhan') reported the results of study of the endocrine glands development (suprarenal, thyroid, and thymus) during the embryonal and early postnatal stages. K. P. Ryabov (Uzhgorod) reported on age-related changes of the suprarenal parenchyma in animals under conditions of higher physical loads.

In the report of L. G. Bukovskaya, N. D. Dovgyallo, B. S. Lebed', S. S. Ryabokon' and A. S. Finiti "On the Growth Anatomy of the Vascular System," the presence of sexual differences in the intensity of the growth of the heart was noted. The study of the vascular system of the heart, cerebrum, and the organs of digestion and motion enabled the authors to establish the fact that an increase in the functional load leads to the truncation of the arterial bed and the appearance of new vascularization components.

In the report of N. M. Kovrizhko (Kiev) the age-related changes of the histological structure of certain extra- and intra-organ arterial vessels were described.

Ye. N. Kiyevskaya (Vinnitsa) reported on age-related peculiarities of facial veins in human beings. The theme of the report of L. A. Alfutova (Sverdlovsk) was: "Comparative Characteristics of Data of the Roentgenokymographic Study of the Heart of Adolescents, Boys and Girls."

A. I. Strukov and I. M. Kodolova (Moscow) in the report "Functional Morphological Bases of Pulmonary Segmentation Pathology in Children" noted that in the study of localization and distribution of pathological processes in the lungs a knowledge of the functional anatomical peculiarities of the pulmonary segments is very important. The study of the authors attests to the fact that certain pulmonary segments are of particular importance in the pulmonary pathology of childhood. Data on age-related characteristics of the projection of interlobar pulmonary areas on the anterior of the thorax was submitted by N. A. Levina (Moscow).

N. F. Uruzova (Izhevsk) noted that nerve endings in the pulmonary tissue appear very early (in 3.5-month-old

fetuses). Subsequently, with the development of pulmonary tissue the perfection and augmentation of the number of receptors takes place.

One meeting of the session on growth morphology was devoted to changes in the lymphatic system.

Ye. A. Dobrovol'skaya-Zaytseva (Moscow) submitted data on age-related changes in the lymphatic system of the cardiac membranes in human beings. The author noted that changes in the lymphatic bed of various cardiac layers are conditioned by its functional changes during various periods of growth. M. A. Dolgova and A. V. Borisov (Leningrad) stressed in their report the considerable importance of functional factors in the changes of the lymphatic vessels of the liver.

L. I. Gordeyeva (Moscow) reported that age-related changes of the lymphatic system of the mammary gland depend on the functional state of the ovaries, menstrual cycle phases, presence or absence of pregnancy, etc. (i.e., are essentially functional).

G. S. Satyukova (Moscow) showed the dependence of changes of the lymphatic bed of the skin of the external female genitalia on the age-related changes of the skin proper.

A. I. Sviridov (Kiev) reported on the age-related changes of lymphatic capillaries in human beings. V. M. Klebanov (Perm') described the innervation of the lymphatic nodes of the posterior peritoneal cavity of fetuses and newborn infants.

Over 50 reports on growth physiology and biochemistry were submitted at the Conference, but in view of the limited size of this article we can only mention a few which are of interest to the readers of the journal.

V. N. Nikitin and co-workers (Khar'kov) in their report "Ontogenesis of the Processes of Self-regeneration in the Organism and Certain Factors which Determine it" noted that, under conditions of a brief general or protein hunger, an "improvement" of the proper plasma proteins and an increase in the lifespan of the animals takes place. Under these conditions even old animals assumed a "youngish" look, retained considerable mobility and reactivity, and the biochemical indices of the protoplasm were shifted in the direction of an earlier age-period. In such cases, there was observed in animals a drastic hypertrophy of the supra-renal cortical layer, as well as degeneration of the thymus and lymphatic nodes; the thyroid was retarded in its development and manifested morphological signs characteristic of its low hormonal activity.

The report of I. A. Arshavskiy (Moscow) "On the Problem of Formation of the ?First Conditioned Reflexes in Newborn Infants in Connection with the Problem of the Physiological Norm of this Period" showed that natural conditioned reflexes, particularly the actions familiar to newborn infants (for instance, swaddling), begin to develop during the first few days following birth.

A. V. Korobkov (Leningrad) reported age-related changes of the latent period of the motor reaction, speed, and mobile power of all basic muscular groups of the human body during the period to two to ninety years.

A large number of reports was devoted to age-related characteristics of conditioned reflex activity.

END

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